ISTEP+ Mathematics Sample Items Grades 6-8
(Beginning in Spring 2009)

1. Grade 7 Multiple Choice Item (Computation)

Evaluate: $\dfrac{0.25\left(\frac{1}{2}\div\frac{1}{8}\right)}{-2}$

A. $-\frac{1}{8}$

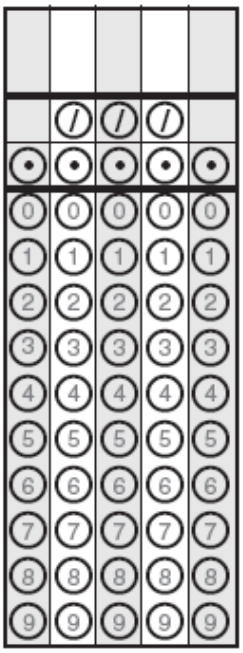
B. $-\frac{1}{2}$

C. -2

D. -8

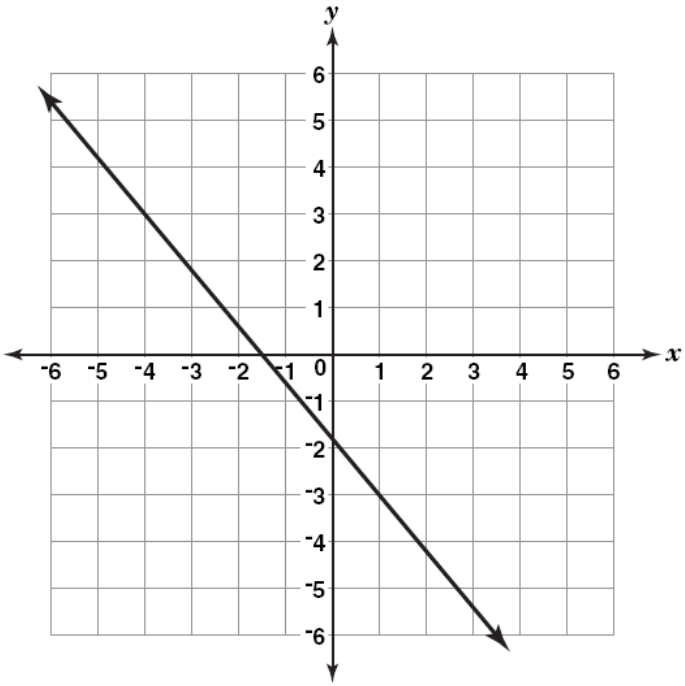
2. Grade 6 Gridded Response Item (Computation)

Evaluate: $\dfrac{8+6\times3}{104\div2}$



3. Grade 7 Multiple Choice Item (Algebra and Functions)

Consider the graph below.



Which of the following shows the slope of the line and one point on the line?

A. $\frac{6}{5}$ and (-3, 1)

B. $\frac{5}{6}$ and (1, -3)

C. $-\frac{5}{6}$ and (-3, 1)

D. $-\frac{6}{5}$ and (1, -3)

4. Grade 6 Constructed Response Item (Alg. & Functions/Problem Solving)

It takes 1 ticket to ride the Ferris wheel at an amusement park. The amusement park earns $144 for each Ferris wheel ride if the cars are full. The Ferris wheel seats 48 people.

Write an equation that can be used to determine the cost (c) for 1 ticket.

Equation_____

The roller coaster ride seats a total of 16 people. It takes 2 tickets per person to ride the roller coaster. One ticket for the roller coaster costs the same amount as one ticket for the Ferris wheel.

If a full Ferris wheel is run 10 times a day, how many full roller coaster rides need to run each day to earn the same amount of money as the Ferris wheel?

Show All Work

Answer_____**full roller coaster rides**

5. Grade 7 Constructed Response Item (Alg. & Functions/Problem Solving)

Irene spent half of her weekly allowance playing miniature golf. To earn more money, her parents let her wash the car for $4.

Write an equation that can be used to determine Irene's weekly allowance (a) if she has $12 left after washing the car.

Equation_____

This week Irene used her allowance to buy each of her 5 friends a bracelet and still had $3 remaining. Each bracelet cost the same amount of money.

What was the cost of 1 bracelet?

Show All Work

Answer $_____

6. Grade 6 Constructed Response Item (Measurement & Problem Solving)

Jeff has to determine the cost of border material to install along the perimeter of his rectangular garden. Jeff's garden measures 10 feet by 7 feet.

The material costs $0.42 per foot not including tax.

Jeff states that $15 will be enough money to cover the cost of material including 6% sales tax.

Determine if Jeff's statement is correct. Justify your answer using words, numbers, and/or symbols.

Show All Work

7. Grade 6 Extended Response Item (Measurement and Problem Solving)

A 6th grade class is going on a field trip to see a play.

For the 27 students to go on the field trip, the vans will cost $545, gas will cost $130, and admission to the play will cost $945.

Each student has been paying $4 a week to pay for the trip. The class has already collected $864 for the trip.

How many MORE weeks does each student have to pay $4 a week to have enough money to pay for the entire trip?

Show All Work

Answer_____weeks

The students will also have to pay for the cost of their lunch. The play will provide lunch at a cost of $7.25 per student.

What is the total amount of money each student will pay for the cost of the field trip, including lunch?

Show All Work

Answer $_____

8. Grade 6 Extended Response Item (Measurement and Problem Solving)

Scott is saving money to buy a football ticket that costs $48.

Scott receives $5 every week for doing chores at home. Scott spends $1.50 every week and saves the rest.

How many weeks will it take Scott to have enough money to purchase the football ticket?

Show All Work

Answer_____weeks

Scott can earn extra money by doing chores for his neighbor. His neighbor will pay him $1.50 for each chore that takes him 45 minutes or less.

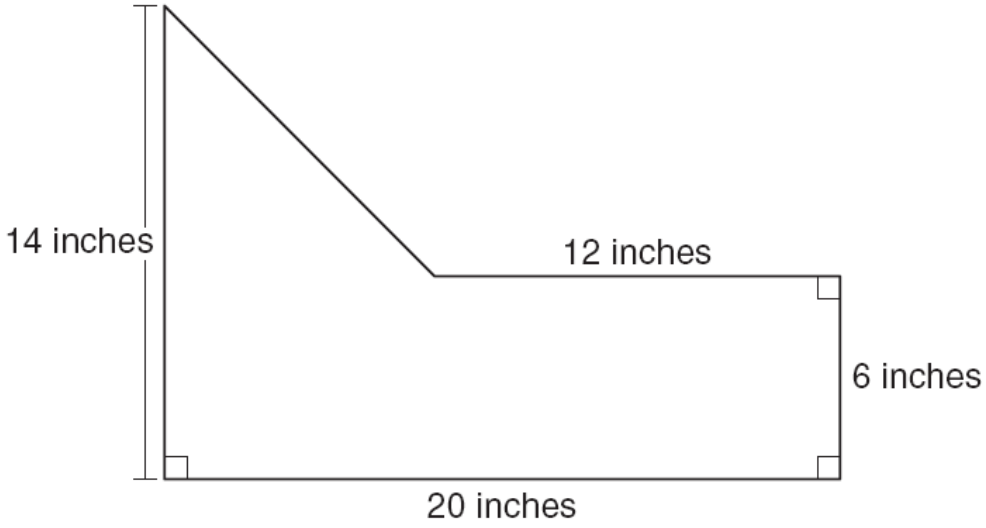
What is the maximum amount of time, in HOURS, that Scott would have to spend doing chores for his neighbor to be able to buy a second ticket for his brother?

Show All Work

Answer_____hours

9. Grade 7 Extended Response Item (Measurement and Problem Solving)

The diagram below shows the base of a sculpture that Amy made.



Mike made a base that is similar to Amy's base. The dimensions of Mike's base are ¼ the dimensions of Amy's base.

What is the combined area, in square inches, of both bases?

Show All Work

Answer_____square inches

10. Grade 8 Constructed Response Item (Alg. & Functions/Problem Solving)

Tina and Jim each work at a different car wash. Tina is paid $37 per day plus $1.50 per car she washes. Jim is paid $40 per day plus $1.00 per car he washes.

Write an expression that represents the amount Tina is paid each day given the number of cars (c) she washes.

Expression_____

Write an expression that represents the amount Jim is paid each day given the number of cars (c) he washes.

Expression_____

How many cars must Tina and Jim each wash to earn the same amount of money in one day?

Show All Work

Answer_____

Scoring Guide

1. **B**
2. **½ or 0.5 or equivalent**
3. **D**

4. **Grade 6 Constructed Response Item (Alg. & Functions/Problem Solving)**

- 48c = 144 Or Equivalent Equation

AND

- 15

Sample Process:

48c = 144
c = 144 ÷ 48
c = $3 per ticket

2 x $3 = $6 per roller coaster ride per person
16 x $6 = $96 for 1 full roller coaster ride

Ferris wheel (full) runs 10 times a day:
10 x 144 = $1440

$1440 ÷ $96 = 15 full roller coaster rides

5. Grade 7 Constructed Response Item (Alg. & Functions/Problem Solving)

- $\frac{1}{2}a + 4 = 12$ Or Equivalent Equation

AND

- $2.60

Sample Process:

$\frac{1}{2}a + 4 = 12$
$\quad - 4 \quad -4$

$\frac{1}{2}a = 8$

$2(\frac{1}{2}a) = (8)2$

$a = 16$

$16 - 3 = 13$
$13 \div 5 = 2.6$

6. Grade 6 Constructed Response Item (Measurement & Problem Solving)

- Jeff's statement is not correct. $15 is enough money to cover the cost of materials before tax is included. The total cost is $15.14 when tax is included.

Sample Process:

Perimeter of garden: 2(10) + 2(7)
20 + 14 = 34 feet

34 x $0.42 = $14.28
$14.28 x 1.06 = $15.14

7. Grade 6 Extended Response Item (Measurement and Problem Solving)

- 7 weeks

AND

- $67.25

Sample Process:

545 + 130 + 945 = 1,620
1,620 – 864 = 756

756 ÷ 27 = $28 per student

$28 ÷ $4 = 7 weeks

$1,620 ÷ 27 = $60 per person
$60 + $7.25 = $67.25

8. Grade 6 Extended Response Item (Measurement and Problem Solving)

- 14 weeks

AND

- 24 hours

Sample Process:

$5 - $1.50 = $3.50 saved each week
48 ÷ 3.5 ≈ 13.7 so 14 weeks are needed

$1.50 for each chore 45 min. or less
So, $3 for 1.5 hours
48 ÷ 3 = 16
16 x 1.5 = 24 hours

9. Grade 7 Extended Response Item (Measurement and Problem Solving)

- 161.5 square inches

Sample Process:

Amy's Base:

20 – 12 = 8 inches
14 – 6 = 8 inches

$A_{triangle}$ = ½ x 8 x 8
= 32 square inches

$A_{rectangle}$ = 20 x 6
= 120 square inches

120 + 32 = 152 square inches

Mike's Base:

¼ of 14 = 3.5 inches
¼ of 12 = 3 inches
¼ of 6 = 1.5 inches
¼ of 20 = 5 inches

5 – 3 = 2 inches
3.5 – 1.5 = 2 inches

$A_{triangle}$ = ½ x 2 x 2
= 2 square inches

$A_{rectangle}$ = 5 x 1.5
= 7.5 square inches

7.5 + 2 = 9.5 square inches

9.5 + 152 = 161.5 square inches

10. Grade 8 Constructed Response Item (Alg. & Functions/Problem Solving)

- Tina: $37 + $1.50c

And

- Jim: $40 + $1.00c

And

- 6 cars

And

Sample Process:

Cars Washed	Tina's Pay	Jim's Pay
1	37 + 1.5(1) = 38.5	40 + 1(1) = 41
2	37 + 1.5(2) = 40	40 + 1(2) = 42
3	37 + 1.5(3) = 41.5	40 + 1(3) = 43
4	37 + 1.5(4) = 43	40 + 1(4) = 44
5	37 + 1.5(5) = 44.5	40 + 1(5) = 45
6	37 + 1.5(6) = 46	40 + 1(6) = 46